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# PATENT SPECIFICATION

(11) 1437 501

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- (21) Application No. 54638/73 (22) Filed 24 Nov. 1973  
 (23) Complete Specification filed 11 Nov. 1974  
 (44) Complete Specification published 26 May 1976  
 (51) INT CL<sup>a</sup> A23L 1/164  
 (52) Index at acceptance  
 A2B 1B 1C 1E 1V 1X  
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## (54) FOODSTUFF COMPOSITION

(71) We, FISONS LIMITED, a British Company, of Fison House, 9 Grosvenor Street, London, W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an improved foodstuff.

In the preparation of foodstuffs containing cereals in flake form difficulties are encountered when it is attempted to incorporate additives into the dry foodstuff. A particular example of this is in the preparation of a muesli-type breakfast food based on rolled oats and/or cut wheat where it is desired to incorporate flavours, vitamins and the other additives in comparatively small amounts into the rolled coats and/or cut wheat base. These additives are usually available in powder form and attempts to dry mix them with the wheat or oats are not satisfactory in that the powders segregate out from the mixture. Whilst some of the additives notably the fruit flavourings, are available in flake form, this form is more expensive than the powder form. Also, more of the flake form is usually required to achieve the same effect as the powder form. Commercial preparations have therefore been based on the powder additives, despite the known disadvantages thereof.

We have now devised a method by which the problems of segregation of powder additives during mixing with cereals in flake form may be reduced. The term 'flake' is used herein to denote that the shape of the cereal particles is more or less flat plates.

Accordingly, the present invention relates to a method for preparing a foodstuff comprising a major proportion of cereal in flake form and a minor proportion of a particulate additive which method comprises mixing the cereal with the additive characterised in that the additive is employed in granular form.

By providing the additives in granular form the problem of segregation is reduced and, where the additives are fruit flavours and

fruit acids it is possible to improve the overall flavour of the foodstuff to an extent which usually cannot be achieved even with real fruit pieces.

The term 'granular' is used herein to denote particles of material which have been formed by the aggregation of smaller particles.

The invention also provides a foodstuff comprising a cereal in flake form in admixture with an additive in granular form.

Whilst the invention may be applied to foodstuffs derived from a wide range of cereals, e.g. corn flakes and the like, it is of especial use in the preparation of muesli-type breakfast foods based on rolled oats, optionally in admixture with other cereals. For convenience, the invention will be described with respect to the preparation of mueslis. Where other foodstuffs are to be prepared, this may be done in essentially the same manner as described below, but using the appropriate ingredients.

In preparing the muesli, the conventional ingredients are used, namely cereal in flake form, fruit pieces, sugar and additives. Typical additives include fruit flavourings, e.g. apple or apricot; vitamins, e.g. vitamins A, B1, B2, C and D and nicotinic acid; poly unsaturated fatty acid esters, e.g. linoleic acid glycerol tri-ester; fruit acids, e.g. malic or citric acids; trace metal compounds, e.g. copper carbonate, cobalt sulphate and iron salts; and/or colouring agents. In many cases it will be desired to incorporate a stabilizer and/or preservative therein, e.g. antioxidants and benzoates. These additives are commercially available, usually in powder form, and require conversion into granular form for present use.

The granules may be formed by a number of methods, an example of which is tumbling or agitating the powders in the presence of a fluid medium. The fluid medium may be merely water which is sprayed onto the particles as they are tumbled or agitated, or may be an aqueous solution of one or more of the additives. If desired, part of the water may be used in the form of steam to aid granulation. In many cases it may be necessary

to incorporate a binder medium into the mixture being agitated or tumbled so as to produce coherent granules. Suitable binder media include edible natural gums, such as agar, agar or gum acacia; cellulosic materials, such as methyl cellulose and its derivatives, and cellulose ethers, e.g. hydroxypropyl methyl cellulose ether; and sugars. Conveniently the binder is incorporated as an aqueous solution or suspension thereof which is sprayed onto the additive particles. Where a binder is used, this will usually be used in from 0.1 to 5%, e.g. 0.3 to 1% by weight of the dry weight of the mixture being granulated.

The tumbling or agitation of the additive is carried out using conventional techniques, e.g., in a rotating pan or drum type granulation device. If desired, mixtures of additives may be fed to the same granulation device to produce granules each containing more than one additive or the various additives may be granulated separately. Thus, it may be desirable to form granules containing the fruit flavours separately from those containing the vitamin additives, e.g., where cereal formulations of different flavours but otherwise similar formulations are to be produced.

Alternative methods by which the additive particles may be granulated include compaction of the particulate material to form tablets or pellets of the desired size. Compaction may be carried out using conventional tabletting techniques, optionally using one of the binders referred to above. The particulate additives may also be granulated using extrusion type methods, e.g. by forcing moistened particles through apertures. Typically this method is carried out by feeding the moistened particles to a sieve over which a scraper blade is reciprocated or rotated to force particles through the sieve apertures to form pellets. The moistened particles preferably have a moisture content of from 2 to 12% by weight on a dry weight basis.

The conditions under which the additive particles are granulated may be varied in known manner to produce granules of the desired form and size. For use in cereal foodstuffs the granules desirably have an irregular shape, a high specific surface area and are of low specific gravity in order that they should not segregate out from the cereal flakes during mixing. It is therefore preferred to use the rotating drum or extrusion types of granulation process described above in this case. Whilst the optimum granule size will vary according to the particle size of the cereal with which the granules are to be mixed we have found that it is usually necessary to form additive granules which are 2 to 6 mms in diameter.

We believe that food additive granules of such a size containing two or more additive ingredients are new and the invention there-

fore also provides granules having a diameter of from 2 to 6 mms containing two or more food additives selected from fruit flavourings, vitamins, fruit acids, polyunsaturated fatty acid esters, trace metal compounds and/or colouring agents. Preferably the granules contain a fruit flavour and a fruit acid, optionally in combination with a vitamin e.g. vitamin C.

The granules produced by the above processes may require drying in order to produce stable granules suitable for mixing with the cereal flakes. Drying of the granules may be carried out in a number of ways, e.g. by drying the granules on a tray or moving belt through or over which hot air is blown or in a fluidised bed dryer. The moisture content of the granule after drying is less than 13%, preferably less than 6% w/w on total granule.

If desired, the granules of additive may be given a surface treatment before storage or use. Thus, they may be given a surface coating of, say, an oil and/or sugar solution or they may be dusted with sugar powder, cereal flour or talc to reduce their caking properties.

The cereal flakes and the granulated additives are mixed together in the desired proportions, optionally together with other solid ingredients such as sugar, chopped nuts or raisins. Typically, mixing is carried out in the dry state. However, it will be appreciated that granulation of the additives may take place *in situ* during mixing with part of the cereal to form granules containing additives and cereal. These cereal/additive granules may then be mixed with the rest of the cereal flakes. Suitable mixing techniques include mere stirring together of the ingredients or, more preferably, feeding the requisite proportions of the ingredients to a drum mixer. Where some segregation of the additive granules from the cereal flakes does occur during mixing, it may be desired to recirculate the segregated material to the additive granulation stage for reprocessing.

Whilst the invention has been described in terms of the use of the granulation additives in the production of cereal foodstuffs, it will be appreciated that the novel granules of the invention find other uses, e.g. as flavouring additives for foodstuffs, e.g. cakes or jellies; as the means for putting up food mixes, cake mixes or drink mixes. Where the granules of the invention are to be used as flavouring additives for foodstuffs, e.g. in the muesli formulations described above, it may be desired to flatten the granules into flake shaped particles. This may be done by passing the granules through the nip of a pair of rollers.

The foodstuff formulations of the invention may be packed in single containers, e.g. cartons containing 0.1 to 2 kgs, and otherwise treated as conventional foodstuffs.

The invention will now be illustrated by the

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following Examples in which all parts and percentages are given by weight:

A muesli was prepared as follows

- 5 Vitamin granules were prepared by feeding rolled oats (49.55 parts), sugar (49.55 parts) and vitamin powder (0.9 parts) to a mixer. 10 parts of a 5% solution of gum acacia was sprayed onto the mixture and the product partially dried. The partially dried product 10 was then fed to an apertured plate across which a scraper bar moved. The mixture was forced through the apertures by the bar to give pellets with a size of approximately 2.5 to 3 mms. These pellets were dried in a fluidised bed drier.

- 15 By a similar process granules were prepared from apple powder (76.84 parts), sugar (22 parts), malic acid (0.44), imitation apple flavour (0.22 parts) and 10 parts of a 5% aqueous solution of gum acacia.

The following ingredients were mixed together to give the muesli formulation:

	parts
25 Mixed oat and wheat flakes	173.6
Apple granules	38.6
Vitamin granules	28.6
Sultanas	23.7
Chopped hazelnuts	14.3
Demerara sugar	7.2

- 30 This formulation showed reduced tendency to segregate as compared to formulations prepared from conventional available vitamin and flavour additives. Also, the flavour of the muesli of the invention was enhanced when 35 compared to formulations using the same amount of powdered or flaked flavouring.

#### WHAT WE CLAIM IS:—

1. A method for preparing a foodstuff comprising a major proportion of cereal in flake form and a minor proportion of a particulate additive which method comprises mixing the cereal with the additive characterised in that the additive is employed in granular form.

2. A method as claimed in claim 1 wherein the cereal contains corn flakes, rolled oats and/or cut wheat.

3. A method as claimed in either of claims 1 or 2 wherein the additive is selected from fruit flavourings, vitamins, polyunsaturated fatty acid esters, fruit acids, trace metal compounds and/or colouring agents.

4. A method as claimed in any of the preceding claims wherein the granular additive contains two or more additives.

5. A method as claimed in any of the preceding claims wherein two or more additives are mixed with the cereal, at least one of the additives being provided in granules separate from the other additive(s).

6. A method as claimed in any of the preceding claims wherein the additive granules are from 2 to 6 mms in diameter.

7. A method as claimed in any of the preceding claims wherein the additive granule contains a binder.

8. A method as claimed in any of the preceding claims wherein the additive granule contains less than 13% w/w of water.

9. A method as claimed in any of the preceding claims wherein the additive granules and cereal are mixed, optionally with other ingredients, in the dry state.

10. A method as claimed in any of claims 1 to 8 wherein the additive granule contains cereal in flake form and this additive/cereal granule is then mixed with cereal.

11. A method according to claim 1 substantially as hereinbefore described.

12. A method according to claim 1 substantially as hereinbefore described in the example.

13. A foodstuff whenever prepared by a method as claimed in any of the preceding claims.

14. A foodstuff comprising a cereal in flake form in admixture with an additive in granular form.

15. A foodstuff as claimed in claim 14 wherein each additive granule contains at least two additives.

16. A granule having a diameter of from 2 to 6 mms containing two or more food additives selected from fruit flavourings, vitamins, fruit acids, polyunsaturated fatty acid esters, trace metal compounds and/or colouring agents.

17. A foodstuff as claimed in claim 14 or a granule as claimed in claim 16 wherein each granule contains a fruit flavour and a fruit acid and, optionally, a vitamin.

18. A granule or foodstuff as claimed in any of claims 14 to 17 substantially as hereinbefore described.

19. A granule or foodstuff as claimed in any of claims 14 to 17 substantially as hereinbefore described in the Example.

20. A method for producing a granule as claimed in claim 16 which comprises tumbling or agitating particles of the additives in the presence of a fluid medium.

21. A method as claimed in claim 20 wherein a binder is present during the tumbling or agitation.

22. A method for producing a granule as claimed in claim 16 wherein particles of the additives are agglomerated by compaction.

23. A method for producing a granule as claimed in claim 16 wherein particles of the additives are extruded through an aperture.

24. A method as claimed in claim 23 wherein particles of the additive are forced through the apertures of a sieve.

25. A method as claimed in any of claims 20 to 24 wherein a cereal in flake form is incorporated into the granule.

26. A method for granulating food additives substantially as hereinbefore described.

27. A method for granulating food additives substantially as hereinbefore described in the Example. granule as claimed in any of claims 16 to 19, 28 or 29.
- 5 28. Food additive granules whenever produced by a method as claimed in any of claims 20 to 27.
29. A food additive granule as claimed in any of claims 16—19 or 28 in flake form.
30. A foodstuff comprising a food additive

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Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1976.  
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from  
which copies may be obtained.